FRAME AND A.F. OUTPUT PENTODE

Pentode intended for use as frame output tube in television receivers and as A.F. power amplifier.

QUICK REFERENCE DATA				
Anode peak voltage	V_{a_p}	max.	2	kV
Cathode current	I_k	max.	100	mA
Output power	W_o		5.3	W

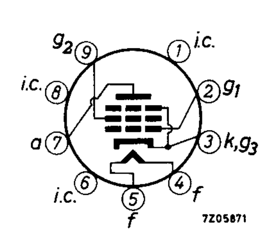
HEATING: Indirect by A.C. or D.C.; series supply

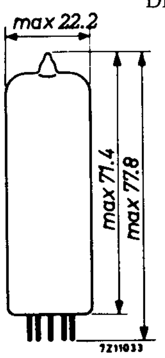
Heater current	I_f	300	mA
Heater voltage	V_f	15	V

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval





CAPACITANCES

Anode to all except grid No.1	$C_{a(g_1)}$		6.8	pF
Grid No.1 to all except anode	$C_{g_1(a)}$		13	pF
Anode to grid No.1	C_{ag_1}	max.	0.6	pF
Grid No.1 to heater	C_{g_1f}	max.	0.25	pF

OPTIMUM PEAK ANODE CURRENT IN FRAME OUTPUT APPLICATION

The circuit should be designed so that the peak anode current does not exceed:

145 mA at V_a = 60 V, V_{g2} = 170 V, I_f = 300 mA
190 mA at V_a = 70 V, V_{g2} = 200 V, I_f = 300 mA
220 mA at V_a = 80 V, V_{g2} = 220 V, I_f = 300 mA

The minimum available value of the peak anode current at end of life and I_f = 285 mA is:

125 mA at V_a = 60 V, V_{g2} = 170 V
160 mA at V_a = 70 V, V_{g2} = 200 V
185 mA at V_a = 80 V, V_{g2} = 220 V

OPERATING CHARACTERISTICS

A.F. power amplifier, class A (measured with V_k constant)

Supply voltage	V_b		170			200		V
Grid No.2 series resistor (non decoupled)	R_{g2}		0			470		Ω
Cathode resistor	R_k		130			215		Ω
Load resistance	$R_{a\sim}$		2			2.5		kΩ
Grid No.1 driving voltage	V_i	0	0.47	6.1	0	0.52	7.0	V_{RMS}
Anode current	I_a	75	-	76	65	-	64	mA
Grid No.2 current	I_{g2}	4.0	-	16.5	3.2	-	11.4	mA
Output power	W_o	0	0.05	5.1	0	0.05	5.3	W
Distortion	d_{tot}	-	-	10	-	-	10	%

Anode supply voltage	V_{ba}		230		V
Grid No.2 supply voltage	V_{bg2}		200		V
Grid No.2 series resistor (non decoupled)	R_{g2}		220		Ω
Cathode resistor	R_k		270		Ω
Load resistance	$R_{a\sim}$		3.25		kΩ
Grid No.1 driving voltage	V_i	0	0.42	5.7	V_{RMS}
Anode current	I_a	56	-	54	mA
Grid No.2 current	I_{g2}	2.2	-	9.7	mA
Output power	W_o	0	0.05	5.4	W
Distortion	d_{tot}	-		10	%

OPERATING CHARACTERISTICS

A.F. power amplifier, class AB, two tubes in push-pull

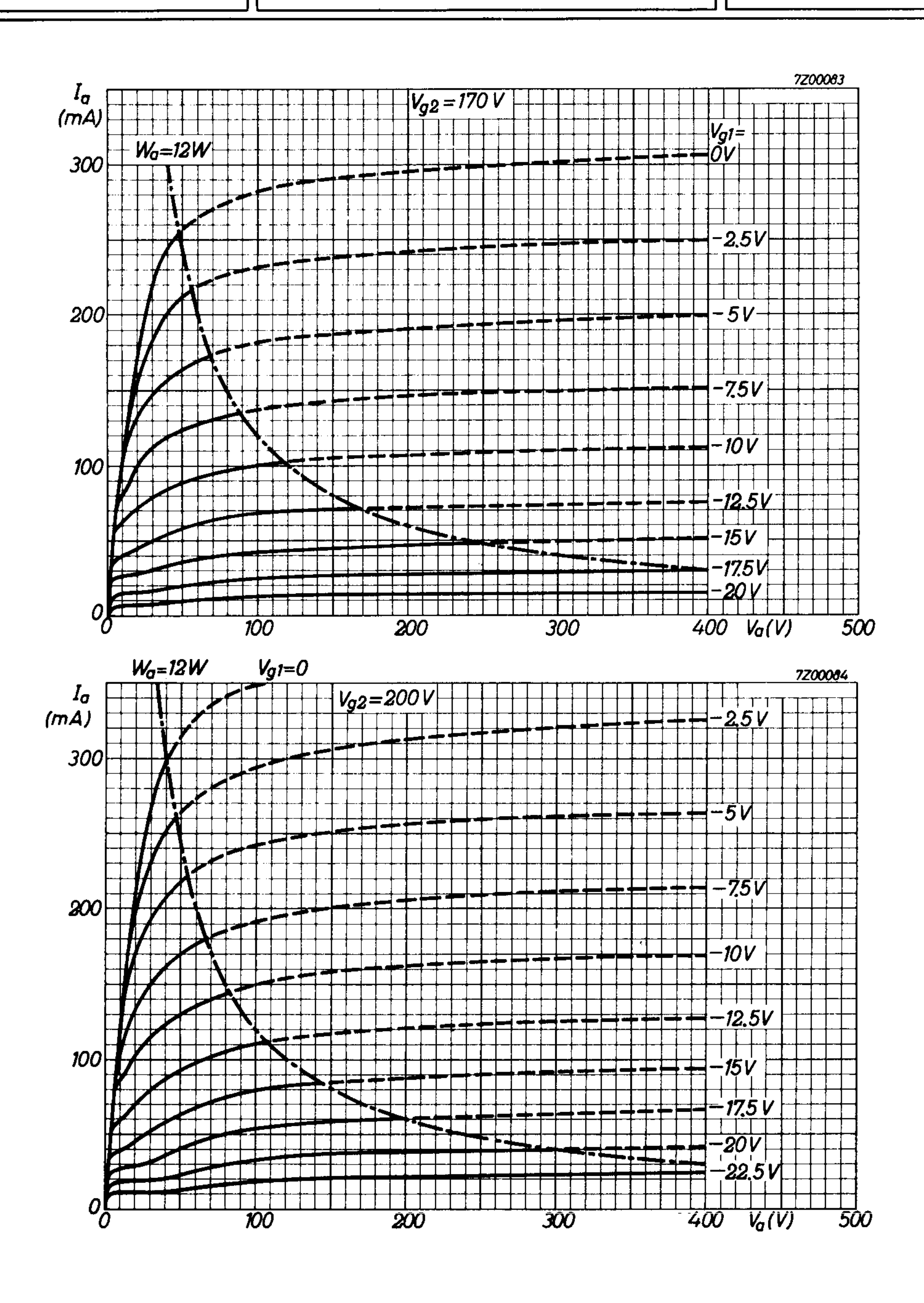
Anode supply voltage	V_{ba}	200			230			V
Grid No.2 voltage	V_{bg_2}	200			200			V
Common cathode resistor	R_k	120			130			Ω
Load resistance	$R_{aa\sim}$	3			4			kΩ
Grid No.1 driving voltage	V_i	0	0.47	14.3	0	0.4	14.6	V_{RMS}
Anode current	I_a	2x60	-	2x64.5	2x56	-	2x61	mA
Grid No.2 current	I_{g_2}	2x3.0	-	2x18.5	2x2.3	-	2x17.5	mA
Output power	W_o	0	0.05	14.3	0	0.05	17.5	W
Distortion	d_{tot}	-	-	3.8	-	-	5.4	%

LIMITING VALUES (Design centre rating system)

Anode voltage	V_{a_o}	max.	550	V
	V_a	max.	250	V
Anode peak voltage	V_{a_p}	max.	2	kV [1]
Grid No.2 voltage	$V_{g_{2o}}$	max.	550	V
	V_{g_2}	max.	250	V
Anode dissipation	W_a	max.	12	W [2]
Grid No.2 dissipation				
average	W_{g_2}	max.	1.75	W
peak	$W_{g_{2p}}$	max.	6	W
Cathode current	I_k	max.	100	mA
Grid No.1 resistor				
for automatic bias	R_{g_1}	max.	1	MΩ
for frame output with automatic bias	R_{g_1}	max.	2	MΩ
Cathode to heater voltage	V_{kf}	max.	200	V

[1]) In frame output circuits where the max. pulse duration is 4% of a cycle with a max. of 0.8 ms.

[2]) For frame output application W_a = max. 10 W.


7Z00083
I_a (mA)
$V_{g2}=170\,V$
$W_a=12W$
$V_{g1}=$ 0V
−2.5V
−5V
−7.5V
−10V
−12.5V
−15V
−17.5V
−20V
0
100
200
300
400
500
$V_a(V)$
7Z00084
$W_a=12W$
$V_{g1}=0$
$V_{g2}=200\,V$
−2.5V
−5V
−7.5V
−10V
−12.5V
−15V
−17.5V
−20V
−22.5V



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